EUROPEAN
COMMISSION

Brussels, 18.6.2019
SWD(2019) 281 final

COMMISSION STAFF WORKING DOCUMENT

Assessment of the draft National Energy and Climate Plan of Poland

Accompanying the document

Commission Recommendation

on the draft integrated National Energy and Climate Plan of Poland covering the period 2021-2030

{C(2019) 4421 final}

Table of contents

1. SUMMARY

Main observations[1]

- ✓ The Polish draft integrated National Energy and Climate Plan (NECP) is well-developed and offers a balanced overview of the five Energy Union dimensions, relying on an integrated assessment. It outlines the planned changes to the energy sector in view of 2030, indicating that energy consumption would remain above 2005 levels. The shift of investments from fossil fuels to renewables is expected to accelerate in the ten year period covered by the plan, and domestic gas and coal production and electricity imports would be maintained. On this basis a strong final plan can be developed if **coherence between targets, objectives and contributions** related to different Energy Union dimensions is fully addressed and underpinned with policies and measures in a way that exploits the opportunities resulting from increased renewable energy and energy efficiency for the modernisation of the economy and job creation.
- ✓ The draft Polish plan contains a comprehensive analytical basis which shows that additional measures are required to achieve Poland's 2030 -7 % **greenhouse gas (GHG) emission** target compared to 2005 for sectors not covered by the EU Emissions Trading System (non-ETS), as set in the Effort Sharing Regulation (ESR)[2]. The draft plan describes qualitatively some planned climate policies and measures, mostly in the transport sector, while scarce information is provided on GHG emission reduction measures in the building and agriculture sectors.
- ✓ Poland intends to use the flexibilities available under the Effort Sharing Regulation[3], if necessary. However the draft NECP does not yet provide information on policies and measures to generate the necessary **Land Use, Land Use Change and Forestry** (LULUCF) credits to comply with the non-ETS target. Poland's Forest Carbon Farm pilot project to increase carbon dioxide removal in forests and improve modelling of carbon sequestration in forests is a good step in this direction.
- ✓ The **renewable energy** contribution **to the EU's 2030 target** set out in the draft NECP (21 %) is significantly below the share of 25 % in 2030 that results from the formula of Annex II of the Governance Regulation, a situation which would also require an indicative trajectory in the final plan that reaches all reference points[4] in accordance with the national contribution set out in the final plan[5]. The draft plan indicates a significant increase of investments in renewable electricity after 2025 compared to previous years. It is important that the final plan demonstrates in a more detailed manner how Poland plans to stay above

[1] In addition to the notified draft NECP this assessment also considers informal bilateral exchanges, which are part of the iterative process established under the Governance Regulation.
[2] Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013.
[3] Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013.
[4] Pursuant to Article 4(a)(2) of Regulation 2018/1999.
[5] Regulation (EU) on the Governance of the Energy Union and Climate Action.

the national 2020 target for renewables (in light of the obligation to respect the 2020 baseline for renewables) and how it will meet all three reference points on the indicative renewables trajectory to 2030. More importantly, renewable energy could play an increasingly important role in creating more jobs and business opportunities. The final plan would benefit from elaborating further on the policies and measures allowing the achievement of the contribution and on other relevant sectorial measures.

- ✓ Poland intends to reduce its energy consumption by 2030, but the level of the **energy efficiency contribution** set out in the draft plan appears **modest** considering the level of effort needed to reach the EU's energy efficiency target for 2030. At the same time, the complementary energy efficiency objectives are quantified (for example on smart meters), which constitutes an approach that could be replicated by other Member States. Details on policies and measures could be better elaborated upon in the final plan to support the credibility of the national ambition level.
- ✓ **Energy security** is a very important element of the draft plan. The final plan could prioritise more clearly the key elements in this Energy Union dimension and the interactions between this dimension and the other Energy Union dimensions.
- ✓ On the **internal energy market**, the draft plan sets out intended outcomes related to the electricity **interconnectivity level**, energy transmission infrastructure, market integration and energy poverty in a comprehensive manner. The final plan needs to lay out clearly how internal market policies and measures will support the objectives, targets and contributions for 2030. While the draft plan sets out specific policies and measures to define and address **energy poverty**, there would be benefit in further specifying objectives for reducing energy poverty and intended impacts in the final plan.
- ✓ On **research and innovation**, the 'Directions of Energy Innovation Development' of the Polish Ministry of Energy are a solid basis for developing further underpinning policies and measures to be included in the final plan, in which a clearer distinction between objectives, and implementation of policies and measures could be made.
- ✓ Poland aims at 1 million electric vehicles by 2025. While **electromobility** is covered well as a cross-cutting issue in various sections of the draft plan, the final plan could be more precise on policies and measures and required charging infrastructure planned and on the implications of this target in different dimensions of the Energy Union.
- ✓ The draft NECP provides **investment needs** of annually around 3 % of GDP for modernising the energy producing sector to achieve the energy objectives and specifies them by fuel for electricity. A complete final plan would cover investment needs also for energy efficiency and other greenhouse gas reducing measures. This would take full advantage of the role NECPs can play in providing clarity to investors and attract additional investments in the clean energy transition.
- ✓ The final plan would benefit from addressing impacts of planned policies and measures including the use of EU funds on **competitiveness** more consistently, reflecting also the opportunities of the modernisation of the economy.
- ✓ The draft plan refers to **regional cooperation** in different high-level groups such as the Visegrad Group and the Pentalateral Forum (Penta Plus) as well as planned bilateral initiatives. There is potential for intensifying the already existing cooperation, especially in areas such as energy security and internal market, just transition issues, decarbonisation and renewables deployment.

- ✓ The plan mentions several measures with potentially synergetic impacts on air quality and climate, especially in the domestic heating and transport sectors. However, the final plan would benefit from strengthening the analysis of the interactions with **air quality and air emissions policy**, including from a quantitative perspective.
- ✓ The final plan would benefit from details on **just and fair transition** issues, such as information on the applicability of the concept of just transition in the national context, for example related to the transition of coal, or carbon-intensive or industrial regions, and considerations in terms of costs and benefits and cost-effectiveness of planned policies and measures. The draft plan would benefit from providing more details on the question of skills and training.
- ✓ When completing the final plan with national policies, timelines and measures that are planned to phase out **energy subsidies, in particular for fossil fuels**, measures mitigating the impact on vulnerable consumers should receive specific attention. A list of all **energy subsidies** and actions undertaken and planned to phase them out, in particular for fossil fuels, need to be included in the final plan.
- ✓ The draft NECP includes a detailed and comprehensive set of climate adaptation policies and measures, such as actions to protect biodiversity and forest management in the context of climate change. This constitutes an example of **good practice**, which could be replicated by other Member States.

Preparation and submission of the draft plan

Poland notified its draft National Energy and Climate Plan (NECP) to the European Commission on 9 January 2019.

There was no **public consultation** on the draft National Energy and Climate Plan but a web-based consultation took place after the draft NECP was published,[6] with a deadline after the public consultation on the draft Energy Policy for Poland to 2040. The section of the draft plan dedicated to **regional cooperation** was not completed. However, some information is available as regards regional cooperation in specific Energy Union dimensions (decarbonisation, energy security, internal energy market), indicating that exchanges with other Member States have started.

Overview of the key objectives, targets and contributions

The following table presents an overview of Poland's objectives, targets and contributions under the Governance Regulation[7]:

[6] https://www.gov.pl/web/energia/projekt-krajowego-planu-na-rzecz-energii-i-klimatu-na-lata-2021-2030

[7] Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council.

	National targets and contributions	Latest available data	2020	2030	Assessment of 2030 ambition level
	Binding target for greenhouse gas emissions compared to 2005 under the Effort Sharing Regulation (ESR) (%)	+14	+14	-7	As in ESR
	National target/contribution for renewable energy: Share of energy from renewable sources in gross final consumption of energy (%)	10.9	15	21	Below 25 % (result of RES formula)
	National contribution for energy efficiency: Primary energy consumption (Mtoe)	99.1	96.4	90.9	Modest
	Final energy consumption (Mtoe)	71.0	71.6	66.2	Modest
	Level of electricity interconnectivity (%)	4	8	Not provided	N/A

Sources: EU Commission, ENERGY STATISTICS, Energy datasheets: EU28 countries; SWD(2018)453; European Semester by country[8]; COM/2017/718; Polish draft NECP.

2. ASSESSMENT OF THE AMBITION OF OBJECTIVES, TARGETS AND CONTRIBUTIONS AND ADEQUACY OF SUPPORTING POLICIES AND MEASURES

Dimension decarbonisation, renewable energy

Greenhouse gas emissions and removals

Poland's draft NECP refers to its 7 % **greenhouse gas emission reduction target by 2030** compared to 2005 for sectors not covered by the EU ETS under the Effort Sharing Regulation (ESR)[9]. The draft plan indicates that emissions in those sectors will decrease, however the rate of such changes may not be sufficient to meet Poland's 2030 commitments. The "with existing measures" scenario shows an emission increase of 5 % and a gap to target in 2030 of 12 percentage points. The projection uses an estimate for Poland's 2005 effort sharing sector emissions of 195.7 million tons (Mt) CO_2eq which is higher than the most recent publicly

[8] https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/eu-economic-governance-monitoring-prevention-correction/european-semester/european-semester-your-country_en.

[9] Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030.

available 2005 base year estimate of 180 Mt CO_2eq[10]. Based on the latter value the European Commission estimates that with existing measures the gap in 2030 could be 21 percentage points. It is possible that the draft plan underestimates the gap to target significantly.

If necessary, Poland intends to use the LULUCF flexibility (up to 21.7 Mt for the whole period 2021-2030 CO_2eq) and transfers from other Member States for achieving its 2030 non-ETS target, as well as the safety reserve for compliance if available and if flexibilities are not sufficient. The draft plan describes some existing policies and measures, while reporting few additional elements.

Buildings are, with a share of 30 % of ESR emissions in 2016, the largest effort sharing sector. According to the Polish with additional measures (WAM) scenario, additional policies would need to contribute around 15 Mt CO_2eq emission savings. On buildings, the draft plan refers to existing national and EU-level policies and measures listed under the energy efficiency dimension of the Energy Union. An example of such a measure related to buildings is Poland's white certificate scheme.

Transport is the second biggest effort sharing sector with a share of 27 % of greenhouse gas emissions in 2016. Poland refers to a target for greenhouse gas emission reductions for cars and vans, and the WAM analysis indicates that additional transport policies would need to contribute around 13 Mt CO_2eq emission savings. While there is broad range of policies and measures for transport in the draft plan, these and their expected emission saving contributions are not detailed. Considerable investment is planned in establishing infrastructure for liquefied natural gas. Decarbonisation of the transport sector is expected through use of alternative fuels included electromobility (with conventional biofuels representing the largest share), shift to public and low-emission transport, and other measures. Such measures are financed by the Low-Carbon Transport Fund with a volume of around EUR 1.5 billion over ten years. More details on how related policies will be developed in the future for all alternative fuels (including hydrogen/CNG) would be welcome. Poland has an ambitious indicative target of 1 million electric vehicles by 2025. It would be useful to clarify, in the final plan and related to both greenhouse gas emissions and renewable energy in transport, implications of this target in terms of the need for additional charging infrastructure and other specific policies.

The draft plan does mention the rational use of fertilisation as an area of action in **agriculture**, however it does not define objectives or additional measures for greenhouse gas emission reductions. The draft plan refers to the Common Agricultural Policy as a tool for reducing greenhouse gas emissions from agriculture.

On **forests,** the draft plan mentions improved forest management as a means for increasing carbon removals (Forest Carbon Farm pilot project) and outlines multiple measures aimed at protecting biodiversity and adapting forest management in the context of climate change. The expected impact of these measures is not quantified.

With respect to the National Forestry Accounting Plan including the national Forest Reference Level, submitted by Poland as required by Article 8(3) of the LULUCF Regulation[11], the

[10] Commission SWD(2018)453 final, Table 4. The relevant 2005 base year is sensitive to the reflection of the ETS scope changes between 2005 and 2013 and methodology updates of the GHG emission inventories which have to be applied consistently backwards if occurring.

Commission has put forward technical recommendations requesting action on a number of issues, detailed in SWD(2019) 213.

The draft plan has a brief description of the state of play of Poland's strategic adaptation plan, of its adaptation goals and of work on updating Poland's adaptation strategy.The draft NECP includes a detailed and comprehensive set of adaptation policies and measures, such as actions to protect biodiversity and forest management in the context of climate change.

Renewable energy

Poland has significant renewable energy resources (notably biomass and wind) that are available in a 2030 perspective as domestic alternative to fossil fuels.

Poland sets out, in its draft plan, a **contribution** to the EU's 2030 target of 21 % of renewable energy in **gross final consumption of energy**. The contribution is significantly below the 25 % renewable share in 2030 that results from the formula in Annex II of the Governance Regulation. While the draft plan provides an indicative trajectory to reach the 21 % contribution in 2030, the starting point in 2021 is below the national target of 15 % for 2020. As a consequence, the obligation to maintain the share of renewable energy at a level of at least the national target of 15 % also beyond 2020 would not be met. Moreover, the requirement to meet reference points of 18 % by 2022, 43 % by 2025 and 65 % by 2027 on the trajectory to 2030, required by the Governance Regulation, would not be fulfilled for the initial reference point when the projected starting point in 13.8 % in 2020 is used as baseline. If Poland indeed plans not to attain the required levels by domestic policies and measures, the final plan would need to make clear whether the options foreseen by the delivery gap filling mechanisms under the Energy Union Governance (such as the Union renewable energy financing mechanism) or under the recast Renewable Energy Directive[12] would be used in order to attain the levels required for the three reference points.

A rough indication of sectorial and technology trajectories is provided. However, values are only provided for the years 2020 (before the starting point of the indicative trajectory to the national 2030 contribution), 2025 and 2030. 2030 shares of 29.5 % of **renewable electricity** (up from 16.4 % in 2020)[13], of 25.2 % of **renewable energy in heating and cooling** (up from 16.7 % in 2020), and of 15.5 % of **renewable energy in transport** (up from 10 % in 2020) are estimated.

There is a clear indication of investment needs in **renewable electricity**. These are expected to double from the first five-year period (2021-2025) to the second five-year period (2026-2030), reaching a very significant share of overall electricity-related investments. Instruments for promoting renewable electricity production (auctions, feed-in tariffs, etc.) are set out, without indicating the expected outcome of these instruments.

The draft plan is contradictory as regards the share of **renewable energy in heating and cooling**. While the level of 25.2 % in 2030 appears to imply an increase of 0.85 percentage points per year on average (based on the increase of 8.5 percentage points over the whole period), it also refers to

[11] Regulation (EU) 2018/841 on greenhouse gas emissions and removals from land use, land use change and forestry.
[12] Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources.
[13] Note that in one instance, the share of renewables in electricity indicated is lower: 27 %. If there was a similar discrepancy in the final plan, an explanation is needed.

an increase of the share of renewable energy in heating and cooling by 1 to 1.3 percentage points with no more details. Actions to increase renewable energy in district heating and cooling through the use of local renewable energy sources are planned to increase by at least 1 percentage point per year. However, there is no information on the role of waste heating and cooling. There are insufficient details on how the renewable energy share in heating and cooling and in district heating would be increased.

For **renewable energy in transport**, the draft plan indicates that the obligatory advanced biofuel targets will be met. The share of conventional biofuels by 2030 is set at 7 %, to be achieved via a blending obligation. While a detailed breakdown per technology is included the draft plan, there is no indication of whether and how multipliers and the subtarget for advanced biofuels foreseen in the recast Renewable Energy Directive[14] were included in the calculation of the 15.5 % target for renewable energy in transport. References to biofuels are included in the draft plan; however without disaggregating advanced biofuels. On support for advanced biofuels, the draft plan outlines options without indicating which one would be pursued.

Policies and measures related to renewable energy remain under consideration without providing detailed information, also on financial implications. This makes it difficult to assess the consistency between the level of ambition and the sufficiency of policies and measures in place to attain the national contribution set out for 2030. It is not clear which existing policies and measures will be continued after 2020.

Dimension energy efficiency

The national contribution to the **EU 2030 target on energy efficiency** is set out, at a 23 % reduction of **primary energy consumption** compared to 2007 reference projections. This contribution is based on the scenario with additional measures. However, the absolute level of the contribution was expressed in gross inland consumption and needs to be corrected in the final plan.

Poland does not justify its level of ambition, but indicates that reaching its energy efficiency target would require a lot of effort, given the projected growth in the transport and services sector, as well as higher comfort levels of households (including higher penetration of electrical appliances) expected in the future. While the proposed energy efficiency contribution would require a decrease in energy consumption compared to 2017 and compared to the Polish 2020 energy efficiency target, the Poland's contribution to the Union's 2030 target would remain above 2005 levels. Considering the need to increase efforts to collectively reach the Union's 2030 energy efficiency targets, the energy efficiency contribution set out in the draft plan appears modest.

The draft plan indicates that support of alternative fuels, in particular electro mobility, thermo-modernisation of buildings and better energy performance of products would help offset drivers of higher energy consumption. The existing system of white certificates remains the main measure to achieve energy savings in the next decade, aimed at supporting the implementation of building investment projects, including the insulation of industrial plants, the renovation of equipment and the modernisation or replacement of lighting systems. Yet, changes to this certificate system remain unclear. The energy savings target under Article 7 of the revised

[14] Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources.

Energy Efficiency Directive[15] are estimated at around 31 ktoe in 2021-2030, but this number appears low and incorrectly calculated. The draft plan also indicates that this value would be diminished by savings prior to 2020, raising concerns whether an exemption clause under the revised Energy Efficiency Directive was correctly applied.

Infrastructure and supply-side energy efficiency measures (smart grids, improvements in heating and cooling and in gas infrastructure) also play a strong role. However, heating and cooling (including technology efficiency improvement and technology shift) is not sufficiently addressed from the energy efficiency point of view.

Although building refurbishment plays an important role, elements related to the long-term renovation strategy remain vague. It is not clear to what extent related impacts have been taken into account in the scenario with additional measures underpinning the national energy efficiency contribution. Furthermore, despite emphasis on the development of electromobility and alternative fuels the final plan could further explore ways to reduce energy consumption in transport (e.g. incentivising multimodality and modal shift, intelligent transport systems, digitalisation and automation).

Overall, information on **planned policies and measures** is too general and does not specify the expected outcomes. It remains unclear, for many policies and measures, whether the information relates to existing programmes, or new programmes, and how these would differ from current policies and measures if these were continued.

These limiting factors prevent a comprehensive assessment of whether policies and measures are sufficient for attaining the national energy efficiency contribution for 2030. It is not possible to conclude if the level of efforts is really higher than in the current decade. Recent increases in energy consumption in Poland point to the need for policies and measures producing an effect early in the ten year period covered by the draft NECP.

Dimension energy security

Compared to EU average, the Polish energy mix has a significantly higher share of solid fuels (notably coal and lignite), which are mainly used in power generation and heating. At the same time, Poland's energy dependency, i.e. the proportion of energy that the economy is importing, is currently lower than EU average. The draft plan foresees that coal, considered as stable and reliable energy supply, will keep a significant share in electricity generation. This share gradually declines from the current 77 % coal and lignite in electricity generation to a share of coal in electricity generation of 60 % in 2030. Under the scenario with additional measures, the draft plan indicates that the share of coal is reduced by some 10 percentage points in final energy consumption by 2030 compared to current levels. Moreover, total national coal and lignite production reduces by some 12 % between 2020 and 2030 under the same scenario.

The draft plan sets out the ambition for Poland to become a gas transmission and trade centre for the region. However, there is no description as regards the steps to be taken in this regard from a financing perspective.

[15] Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency as amended by Directive (EU) 2018/2002.

The draft plan describes the objective to limit, with national legislation, dependency on a single source of gas to 33 % in 2023. It outlines the infrastructure projects that will contribute to this objective. The final plan should be clearer on which of these infrastructure projects are Projects of Common Interest (PCIs) and provide more detailed information.

The recently introduced rules, which, de facto, make it impossible to store gas outside of Poland for the purpose of complying with the Polish law on compulsory storage obligations, may create market distortion and discrimination, which are neither necessary nor proportionate with regards to the objective of security of supply. They may further put the Polish incumbent, who owns all the gas storage facilities in Poland, in conflict of interest, since the incumbent would be able to decide (via granting access to its storage facilities), which companies could import gas to the Polish market and thus compete with the Polish incumbent downstream. The final plan should clarify how the impact of these current rules will be mitigated over the ten year period covered by the NECP.

Developing nuclear energy is one of the objectives recalled in the draft plan. Activation of a first block of the first nuclear power plant is foreseen to take place in 2033.

Dimension internal energy market

The Polish electricity wholesale market has become more competitive in the past years and the concentration of the power generation market is much below the EU average. However, the market is still dominated by incumbentsl. Limited interconnection capacity[16] played a role in recent electricity price increases in Poland due to constrained electricity imports.[17] However, the gas wholesale market remains relatively closed and the dominant position of the state-owned gas company has an impact on competition.

As regards **interconnections**, the draft plan focuses on the key issue of reducing loop flows – excess electricity spills in Poland to be alleviated by ongoing PCIs reinforcing the North-South corridor in Germany – and on the synchronisation of the Baltic States, without specifying the current and planned level of electricity interconnectivity by 2030. Information is missing on already received investment support and on national financing schemes.

In general, objectives and targets for markets are set out in the draft plan addressing, for example, the role of the Polish transmission network in achieving an integrated and competitive gas market in Central and Eastern Europe. In the final plan, objectives and targets for wholesale markets should be more specific, stating intended outcomes and focusing on issues also addressed by network codes in gas and electricity. For instance, the final plan could clarify the intended impacts of major public interventions that are related to market integration.

Only limited information on **market functioning** and market-related issues is provided. Core quantitative parameters related to the current situation of electricity and gas markets, such as wholesale and retail market concentration levels, indicators for market liquidity are needed to assess the functioning of the market and to identify potential obstacles for market entrants. A general, qualitative description of the current situation is often provided but there are no specific indicators which could serve as benchmark related to real-time price signals, demand response and aggregation, and competitiveness in the retail energy sector.

[16] Limitations in interconnection capacity are partially result of unscheduled electricity flows.
[17] For more detail see SWD (2019) 1020 final.

As competitive markets are a key enabler for other dimensions of the Energy Union, objectives related to the further development of wholesale and retail market competition and corresponding measures and timelines merit being included in the final plan.While the draft plan addresses quantified objectives for smart metres as a technology that can enable flexibility services, further details are needed on **system flexibility** in the final plan. For example, there is no data on the situation with respect to barriers for new market participants (e.g. aggregators) and the uptake of the different sources of flexibility (demand response, storage, distributed generation) nor does it specify the related policy objectives in detail, or policies and measures to reach these objectives. A robust final plan would provide a quantitative overview of the development of the different sources of flexibility that are needed to integrate the rising share of renewable energy into the electricity system.

A comprehensive energy poverty policy is under preparation. This includes the development of an underlying definition of energy poverty. While the objectives for reducing **energy poverty** are vague in the draft plan, not specifying sufficiently the intended impact, specific policies and measures to define and address energy poverty are set out. This includes, for example, measures related to monitoring and mitigating energy poverty, welfare support and energy efficiency actions.

Dimension research, innovation and competitiveness

Objectives for research, innovation and competitiveness included in the draft plan rely, to a large extent, on the national **research** programme of 2011. This document is expected to be revised by 31 of March 2020 in order to align it to the Polish responsible development strategy and the energy policy for Poland to 2040. The information provided in the draft plan can serve as a basis for an assessment in view of 2030 plans to a limited extent only.

Beyond this, the Polish Ministry of Energy has developed "Directions of Energy **Innovation** Development" providing a broad framework for innovation activities and the promotion of the commercialisation of technologies resulting from promising research projects. This document includes a detailed set of measureable and time related objectives for 2030, for example related to projects on an integrated and interconnected energy system, which can be regarded as very ambitious. The NECP would benefit from presenting a comprehensive analysis on where the low-carbon technologies sector is currently positioned in the global market, including for decarbonizing energy and carbon-intensive industrial sectors, highlighting areas of competitive strengths and potential challenges. The objectives could then be adjusted on that basis, together with policies and measures to achieve them, making appropriate links to enterprise and industrial policy.

On research and innovation funding, Poland is planning to increase spending to 1.7 % of GDP in 2020 and to 2.5 % of GDP in 2030. However, there is no specific information provided about the extent to which this covers Energy Union-related research and innovation.

While the draft plan describes the Polish engagement in the context of the **Strategic Energy Technology (SET) Plan**, the final plan could also clarify how national energy and climate targets for the period 2021-2030 are aligned with agreed SET plan targets.

While the draft plan contains an assessment of impacts in macroeconomic terms, the final plan could further elaborate on the impacts of the planned policies and measures on competitiveness, linked to all five dimensions of the Energy Union. Where targets, objectives and contributions

across the five Energy Union dimensions set out in the draft plan relate to competitiveness, these could be underpinned more consistently by appropriate policies and measures in the final plan.

3. COHERENCE, POLICY INTERACTIONS AND INVESTMENTS

Only limited information on the coherence and interactions between different dimensions of the Energy Union is provided. The coverage of interactions of existing and planned policies and measures could be strengthened.

With Poland's Clean Air Programme of 2017, a major new instrument to reduce local **air pollution** from single family buildings, the draft plan contains a useful example for synergies but also consistency challenges. This programme is an important instrument to increase energy efficiency in the building sector, but also to combat energy poverty. From a decarbonisation perspective, the programme could constitute an effective mitigation policy. However, focusing on replacing inefficient coal boilers by efficient ones would run the risk of locking in coal as heating fuel for single family houses. This could create tensions with decarbonisation objectives, innovation, and possibly energy security (as increased demand for cleaner coal might increase long-term imports of high quality coal). More generally, the final plan would benefit from strengthening the analysis of the interactions with air quality and air emission policies, including by introducing quantitative elements.

Considering the relevance for greenhouse gas emission reductions, the final plan could reflect interactions with the circular economy. The final plan would also benefit from a more detailed analysis about the synergies and trade-offs between climate and biodiversity policies and actions (e.g. role of ecosystem services for mitigation and adaptation), and from clarification of the timing of the announced measures.

Poland's draft plan outlines a projected increase in **biomass use for energy**, with a consistent increase in the share of final energy consumption to about 11 % by 2040. The implications for sustainable biomass supply, land use, land use change and forestry emissions and biodiversity are not assessed in the draft plan and could be clarified in the final plan.

The draft plan mentions neither climate change impacts as risks for **energy security** (e.g. for electricity supply form thermal power plants), nor potential adaptation measures to address these risks. This is despite the fact that Poland's adaptation strategy states energy security as a major objective and includes vulnerability impacts for the energy sector. Information is lacking on adaptation benefits for energy efficiency, such as in the thermal management of buildings. Also related to energy security, the final plan could improve the discussion of the coherence of objectives on renewable energy and on decreasing energy import dependency.

The final plan would benefit from details on **just and fair transition** issues, such as information on the applicability of the concept of just transition in the national context, for example related to the transition of coal, or carbon-intensive or industrial regions, and considerations in terms of costs and benefits, the distribution of costs and benefits and the cost-effectiveness of planned policies and measures. The draft plan would benefit from providing more details on the question of skills and training. It would also benefit from considerations in terms of costs and benefits as well as cost effectiveness of planned policies and measures. Energy prices projections and developments would also be beneficial additions.

Information on how **the energy efficiency first principle** is taken into account in national policies and measures across various Energy Union dimensions would need to be part of a complete final plan.

The draft NECP contains a good starting point for further developing the final plan on **investment needs and expenditures**, funding sources and other relevant information like market barriers and risks. The draft NECP forecasts the necessary capital expenditures in the energy supply sector (electricity, heat, gas, mining and liquid fuels) to achieve the Polish energy objectives as EUR 157.5 billion for the 2021-2030 period (around 3 % of current GDP annually). Investment needs in the electricity generation sector over the period of 2021-2030 are detailed and estimated at EUR 23.9 billion (around 0.5 % of GDP annually) of which 18.5 billion for renewable sources, 2.8 billion for solids and 1.35 billion for gas. Some national and EU funding sources are mentioned for decarbonisation policies. For modernisation activities in the energy sector and for the improvement of energy efficiency Poland intends to make use of its share of the Modernisation Fund as well as other free allowances from the EU ETS totalling at least 411 million ETS emission allowances, corresponding to a value of around EUR 8 billion (for a carbon price of EUR 20/t) in the period 2021-2030[18]. Some investment needs could partly be covered by Union funds, in particular cohesion policy funding, notably in line with the investment guidance for 2021-2027 of the 2019 European Country Semester Report for Poland and with any relevant legislation.

Building on the investment and funding source information provided for the energy supply sector, the information could be consistently completed for all Energy Union dimensions and related groups of policies and measures. The final plan could also address in more detail the decommissioning of old and worn-out coal-fired and lignite plants.

The description of **energy subsidies, in particular for fossil fuels**, is incomplete. There is no indication of other national policies, timelines and measures planned to phase out energy subsidies, in particular for fossil fuels. When completing this, consideration can be given to limiting the net impact of these measures on consumers, especially in relation to protecting vulnerable consumers and addressing energy poverty.

Links with the European Semester

Identifying financing needs and securing the necessary funding will be key to deliver on energy and climate objectives. The Commission had addressed that question as part of the 2019 European Semester process. Based on the 2019 Country Report for Poland, published on 27 February 2019[19], the European Commission's recommendation for a Council recommendation for Poland issued on 5 June 2019[20], in the context of the European Semester, highlights in particular the need to invest in 'transport, notably on its sustainability, energy infrastructure and cleaner energy'. When preparing its overview of investment needs and related sources of finance for the final plan, Poland should take into account these recommendations and links to the European Semester.

[18] The figure is based on the amounts established in Directive (EU) 2018/410 and is subject to various uncertainties, such as the possibility to transfer allowances available pursuant to Article 10c to the Modernisation Fund.
[19] Commission SWD(2019) 1020 final.
[20] COM(2019) 521 final.

4. REGIONAL COOPERATION

The draft plan refers to regional cooperation in specific instances of the policy part and omits the relevant overview section of the template for draft plans, while providing a broader overview in the analytical section 5.4.

On energy security, the draft plan indicates cooperation with the Visegrad Group, with the Pentalateral Forum (Penta Plus), with Member States having advanced nuclear power programmes and like-minded states as regards the use of nuclear power. Similarly, more specific initiatives are also foreseen with Lithuania and Germany on transmission capacities of electricity cross-border interconnections, on the synchronisation of the Baltic states' electricity system and on off-shore energy generation sector in the Baltic Sea region. Poland also addresses cooperation with third countries (two-way high-pressure gas interconnection with Ukraine), which few Member States have done in their draft NECPs.

Other elements briefly addressed are climate cooperation under the Paris Agreement, under the SET-Plan and on renewable energy statistical transfers. Building on ongoing cooperation and consultations, the final plan could broaden the scope of cooperation to other Member States. Regional cooperation has a key role to play in assessing regional system adequacy foreseen in the Electricity Regulation. This will become even more important for ensuring cost effectiveness and in light of the planned continuation of a capacity market, the increasing shares of renewable energy and the corresponding need for providing system flexibility. There could be more consistent coverage of regional cooperation in the political part of the draft plan, indicating how actions will be continued during the implementation of the final plan.

5. COMPLETENESS OF THE DRAFT PLAN

Information provided

Poland's draft NECP is mostly complete. The final plan would benefit from following the structure for NECPs in order to improve comparability and to provide a solid basis for regional cooperation when implementing the final plan.

As regards the **decarbonisation dimension**, the draft plan lacks information on the binding annual **greenhouse gas emission** reductions for 2021-2030 under the Effort Sharing Regulation (ESR)[21]. For LULUCF, the draft plan and its projections do not apply the accounting rules as set out in the LULUCF Regulation[22], which are necessary to assess whether Poland would achieve its overall non-ETS target. This is due to the fact that Poland's forestry accounting plan (which includes the benchmark against which emissions and removals from managed forests are accounted) was still in preparation at the time of submitting the draft NECP.

Trajectories, policies and measures on **renewable energy** are only partly provided (see below). In particular, estimated trajectories by renewable energy technology are necessary for a solid

[21] Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030.

[22] Regulation (EU) 2018/841 of the European Parliament and of the Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU.

final plan. Planned capacities are generally described but are not split between new capacities and repowering. On bioenergy, aggregated numbers are only provided for bioenergy consumption, broken down by energy source. There is no inclusion of trajectories of bioenergy demand, their disaggregation between heat, electricity and transport, and on biomass supply (by feedstocks and by origin), trajectories for forest biomass, and an assessment of its source and impact on the LULUCF sink.

Important information on existing and additional renewable energy measures is missing. For example, it is not clear which existing policies and measures will be continued after 2020. Planned and, to a lesser extent, existing policies and measures do not include a description and the expected outcome. Measures regarding power purchase agreements (PPAs) to reduce administrative burden, communities and to increase self-consumption, as well as a number of measures for biomass, such as the implementation of sustainability criteria, are not included.

With respect to **energy efficiency** the draft plan reflects many of the main elements, but the information could be clearer. Cost-optimal levels of minimum energy performance requirements of buildings and expected savings under Article 5 of the Energy Efficiency Directive are not available in the draft plan. More work is also required to fully reflect the contribution of policy measures to address the energy savings obligation under the revised Energy Efficiency Directive[23]. A more consistent coverage of how policies and measures (also where these relate to electro-mobility) contribute to renovation objectives and to the long-term renovation strategy would make the final plan more robust.

On **energy security**, a complete final plan would address future electricity generation adequacy, including on demand response and storage. Information on how consistency is ensured with existing risk preparedness plans is needed. The final plan could address topics that may become more relevant for energy security in a 2030 perspective, such as cybersecurity and a reflection of preventive action. Information on economic aspects of planned measures announced would also strengthen a final plan.

Regarding the **internal energy market**, the draft plan contains only limited information on core quantitative parameters related to infrastructure and to the functioning of retail and wholesale gas and electricity markets. In particular, the electricity interconnectivity level is not reflected. This does not allow for a full assessment of the draft plan. Clearer and verifiable policies and measures that become part of the final plan could indicate how the objectives set out in the draft plan are intended to be reached. Energy poverty could be addressed more coherently and national objectives on electricity system adequacy and system flexibility set out clearly as part of the final plan.

Information on **research, innovation and competitiveness** is well developed, although the final plan could provide more consistent indications for the period 2021-2030. Some measureable objectives to be achieved by 2030 have been provided with the draft plan. While funding targets for general research and innovation are available, this is not specifically covering Energy Union-related research and innovation. The draft plan does not include specific 2050 national objectives related to the promotion of clean energy technologies. Some objectives for competitiveness related to 2020 are included, but no objectives to be achieved by 2030 are mentioned in the draft

[23] Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency as amended by Directive (EU) 2018/2002.

plan. Policies and measures are listed, some of which for the period up to 2030. However, financing measures are missing. Cooperation with other Member States is described only as regards cooperation under the Strategic Energy Technology (SET) plan.

Robustness of the Polish draft National Energy and Climate Plan

Poland submitted the elements of the **analytical framework** that are required for a complete draft plan. Details on projections for with existing measures (WEM) and with additional measures (WAM) scenarios are well documented in the main document and additional data files. The draft plan also includes an impact assessment (IA) of planned policies and measures.

The **WEM** and **WAM** projections cover the five dimensions of the Energy Union. Additional information would be desirable on the following variables: (i) the differentiation of sectoral GHG emissions also for the F-gases, (ii) GHG emissions from international aviation, and (iii) energy related investments for industry.

Key assumptions, parameters and results are presented in detail. The **transparency** of the projections could be further improved by providing more information on the overall modelling approach.

The **impact assessment** of planned policies and measures is based on an in depth comparison of the WEM and WAM scenarios. The draft plan explains the inclusion of policies and measures in the WEM and WAM scenarios based on a cut-off date. An explicit description, e.g. in the form of a list would further increase the transparency of the final plan. Information on the impact of smaller groups of policies would be useful to assess the robustness of the impact assessment. The final plan should complete the assessment of macroeconomic and, to the extent feasible, the health, environmental, employment and education, skills and social impacts, including just transition aspects.

The key model parameters are largely calibrated to the EUROSTAT figures for the base year 2015. Renewable energy shares for electricity and transport seem to deviate from reported EUROSTAT figures. The draft plan follows its own fuel and EU ETS carbon price assumptions, not using the provided Commission recommendations.